

REPORT DOCUMENTATION PAGE

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MEMORANDUM FOR PRS (Contractor/In-House Publication)

FROM: PROI (STINFO)

02 January 2002

SUBJECT: Authorization for Release of Technical Information, Control Number: **AFRL-PR-ED-AB-2002-001**
Dean Lester (Thiokol); Greg Farmer (SRS); Mike Holmes (PRSS); Wayne Wong (NASA), "Solar
Thermal Propulsion IHPRT Phase I Demonstration Program" **ABSTRACT ONLY**

**43rd AIAA/ASME/ASCE/AHS/ASC Structures,
Structural Dynamics, and Materials Conference
(Denver, CO, 22-25 April 2002) (Deadline: mid-January 2002)**

(Statement A)

1. This request has been reviewed by the Foreign Disclosure Office for: a.) appropriateness of distribution statement,
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APPROVED/APPROVED AS AMENDED/DISAPPROVED

PHILIP A. KESSEL
Technical Advisor
Space and Missile Propulsion Division

Date

Solar Thermal Propulsion IHPRPT Phase I Demonstration Program

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Abstract

Solar thermal propulsion is an innovative concept that will double the efficiency of currently used LH₂ - LO₂ chemical upper stages. Solar thermal propulsion uses the sun's energy to heat a low molecular weight working fluid such as hydrogen to very high temperatures (3,000 K). The stored thermal energy is then converted to kinetic energy as the working fluid exits a diverging nozzle.

This document will report on the completed Phase I Integrated High Payoff Rocket Propulsion Technology (IHPRPT) Solar Thermal Propulsion Demonstration. The Air Force Research Lab (AFRL) has sponsored the team of Thiokol Propulsion and SRS Technologies to demonstrate the technological readiness and performance of an inflatable solar thermal propulsion system. The program culminates in a full-up integrated proof-of-concept ground test of a direct gain solar thermal propulsion system. These tests will demonstrate that the technology is ready for development of flight hardware for Solar Orbital Transfer Vehicles.

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